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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,013	01/16/2002	Wolfgang Rosner	L&L-I0232	5714

7590 04/14/2003

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EXAMINER	
ERDEM, FAZLI	
ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 04/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application No. 10/047,013	Applicant(s) ROSNER ET A	
	Examiner Fazli Erdem	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *1-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 10, 11, and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Forbes et al. (6,448,601) in view of Fitch et al. (5,554,870) further in view of Burns et al. (6,077,745).

Regarding Claims 10,11, and 16, Forbes et al. disclose a memory address and decode circuit with ultra thin body transistors where a decoder for a memory device is provided. The decoder array includes a number of address lines and a number of output lines. The address lines and the output lines form an array. The decoder includes a number of vertical pillars extending outwardly from a semiconductor substrate at intersections of output lines and address lines. Each pillar includes a single crystalline first contact layer and a second contact layer separated by an oxide layer. The decoder further includes a number of single crystalline ultra thin vertical transistor that are selectively disposed adjacent the number of vertical pillars. Each single crystalline vertical transistor includes an ultra thin single crystalline vertical first source/drain region coupled to the first contact layer, an ultra thin single crystalline vertical second source/drain region coupled to the second contact layer, and an ultra thin single crystalline vertical body region which opposes the oxide layer and couples the first and the second source/drain regions. A plurality of buried source lines formed of single crystalline semiconductor material are disposed below the pillars in the array for interconnecting with the

first contact layer of pillars in the array. Each number of address lines is disposed in a trench between rows of the pillars for addressing the ultra thin single crystalline vertical body regions of the single crystalline vertical transistors that are adjacent to the trench. Forbes et al. fail to disclose the required capping layer and insulators and the pillar in the required manner. However, Fitch et al. disclose an integrated circuit having both vertical and horizontal devices and process for making the same where the required capping layer is disclosed. Furthermore, Burns, Jr. et al. disclose a self-aligned diffused source vertical transistors with stack capacitors in a 4F-Square memory cell array where the required insulators and pillars in the required manner is disclosed.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required capping layer and the insulator and pillar in the required manner as taught by Fitch et al. and Burns, Jr. et al. respectively in order to have a vertical memory structure with better performance.

2. Claims 12 and 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Forbes et al. (6,448,601) in view of Fitch et al. (5,554,870) further in view of Burns, Jr. et al. (6,077,745) further in view of Forbes et al. (6,498,065).

Regarding Claims 12 and 13, Forbes et al., Fitch et al. and Burns, Jr. et al. combination fail to disclose the required doping structure. However, Forbes et al. (6,498,065) disclose a memory address decode array with vertical transistors where the required doping structure is disclosed.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required doping structure in Forbes et al. (6,448,601), Fitch et al. and Burns, Jr. et al. as taught by Forbes et al. (6,498,065) in order to have a vertical memory structure with better performance.

3. Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Forbes et al. (6,448,601) in view of Fitch et al. (5,554,870) further in view of Burns, Jr. et al. (6,077,745) further in view of Bertin et al. (6,060,746).

Regarding Claim 14, Forbes et al., Fitch et al. and Burns, Jr. et al. combination fail to disclose the required tunnel structure. However, Bertin et al.disclose a power transistor having vertical FETs and method of making same where the required tunnel structure is disclosed.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required tunnel structure in Forbes et al., Fitch et al. and Burns, Jr. et al. as taught by Bertin et al. (6,060,746) in order to have a vertical memory structure with better performance.

4. Claim 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Forbes et al. (6,448,601) in view of Fitch et al. (5,554,870) further in view of Burns, Jr. et al. (6,077,745) further in view of Biegelsen et al. (5,607,876).

Regarding Claim 15, Forbes et al., Fitch et al. and Burns, Jr. et al. combination fail to disclose the required core structure. However, Biegelsen et al.disclose a fabrication of quantum confinement semiconductor light-emitting device where the required core structure is disclosed.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required core structure in Forbes et al., Fitch et al. and Burns, Jr. et al. as taught by Biegelsen et al. (5,607,876) in order to have a vertical memory structure with better performance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fazli Erdem whose telephone number is (703) 305-3868. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

FE
April 6, 2003

J. FLYNN
PRIMARY EXAMINER
TECHNOLOGY CENTER 2800